

## Description

# CONNECTOR PACKAGE WITH ANTI-ADSORPTION MEMBERS

### BACKGROUND OF INVENTION

### FIELD OF THE INVENTION

[0001] The present invention relates to connector packages for receiving connectors therein, and particularly to connector packages with members that provide easy and safe transportation and handling of the connectors. The application relates to the copending application titled "HARD TRAY FOR CARRYING SOCKET CONNECTORS" having the same applicants and the same assignee with the invention.

### DESCRIPTION OF RELATED ART

[0002] Delicate electronic components such as CPU sockets are often packaged into trays that are stacked into freight containers for transportation. In order to remove the connectors from the package and then remove the package from the stack automatically, such as on a production

line, a pick up cap with a plane top surface is engaged on each connector, and the package is provided with a plurality of plane soleplates. When removing each connector from the package, a vacuum nozzle is actuated to press on and engage the top surface of the cap. Once all the connectors have been removed, the vacuum nozzle presses and engages one of the soleplates of the package to remove the package itself. The vacuum nozzle then proceeds to handle the connectors of another package in the stack. However, when the vacuum nozzle presses on the cap, the package may also be pressed, and the corresponding soleplate of the package may become attached the cap of a connector in the underlying package. Even though such attachment is generally only momentary, it can disrupt or break the engagement of the vacuum nozzle on the cap. This results in inconvenience, delay and efficiency on the production line, and inflates costs.

[0003] Hence, a new connector package is required to overcome the above-described disadvantages.

#### **SUMMARY OF INVENTION**

[0004] Accordingly, an object of the present invention is to provide a connector package with anti-adsorption members which enable high-efficiency transportation and handling

of connectors received in the connector package.

[0005] In order to achieve the aforementioned object, a plurality of connector packages in accordance with a preferred embodiment of the present invention is stacked together used to receive connectors with pick up caps attached thereon. Each package comprises an elongated base defining a plurality of receiving zones, each receiving zone being bounded by two pairs of supporting bars adapted to carry the connectors. A number of the receiving zones each defines a soleplate having a slick upper plane toward the connector and a lower plane toward a package stacked below the former package. Each lower plane further defines a plurality of bulges thereon. While getting the connectors out of the package, a vacuum nozzle is actuated to suction the slick top surfaces of the caps engaged with the connectors, which provides exterior force to withdraw the connectors from the package. After that, the vacuum nozzle suctions the upper plane of the soleplate of the package to remove the package away and sequentially handles the connectors received in another package stacked below. Because of the bulges defined on the lower plane, the lower plane is coarse and the connectors received in the nether package will not adsorb the

lower plane while the vacuum nozzle press on either the slick top surface of the cap or the upper plane of the above package.

[0006] Other objects, advantages and novel features of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings, in which:

#### **BRIEF DESCRIPTION OF DRAWINGS**

[0007] FIG. 1 is an isometric view of a connector package in accordance with the preferred embodiment of the present invention, together with a connector ready to be received in the package and a pick up cap ready to be engaged on the connector;

[0008] FIG. 2 is an isometric view of the package of FIG. 1 inverted; and

[0009] FIG. 3 is an isometric view of two packages of FIG. 1 each having a connector received therein and ready to be stacked together.

#### **DETAILED DESCRIPTION**

[0010] Reference will now be made to the drawing figures to describe the present invention in detail.

[0011] FIG. 1 shows a connector package 10 used for receiving a

plurality of electrical connectors 20 such as a center processing unit (CPU) sockets. In general, a plurality of packages 10 each receiving the connectors 20 therein is stacked into freight containers (not shown) for transportation. The package 10 comprises an elongated base 100, and a plurality of receiving zones 102 in the base 100. Each receiving zone 102 comprises two pairs of supporting bars 104 adapted to carry a corresponding connector 20 thereon. Because the connectors 20 are typically small, it is difficult for them to be removed from the package 10 manually. In order to accomplish the removal automatically, a cap 30 having a plane top surface 300 is engaged on each connector 20, and a number of the centermost receiving zones 102 of the package 10 each have a soleplate 106. This is because a center portion of the package 10 bears the most load when the package 10 is in a stack of the packages 10. The soleplate 106 has an upper plane 108 corresponding to a respective connector 20, and a lower plane 110 (see FIG. 2). The lower plane 110 provides a plurality of bulges 112 thereon, to make the bottom of the soleplate 106 coarse.

[0012] FIG. 3 shows two packages 10, each having a connector 20 received therein, ready to be stacked together. Typi-

cally, during transportation, a great many of packages 10 are stacked into freight containers (not shown), with the receiving zones 102 of the packages 10 being filled with connectors 20. Once at destination such as a production line, in order to remove each connector 20 from a topmost package 10 of the stack of packages 10, a vacuum nozzle (not shown) presses and engages on the top surface 300 of the cap 30 of the connector 20, and pulls the connector 20 out of the corresponding receiving zone 102. After all the connectors 20 have been removed from the topmost package 10, the vacuum nozzle presses and engages on the upper plane 108 of one of the soleplates 106 of the package 10, and removes the package 10 itself from the stack of packages 10. The vacuum nozzle then proceeds to remove the connectors 20 of the new topmost package 10. During the whole process, the vacuum nozzle continuously presses on the connectors 20 and the packages 10. Because the bottom of each soleplate 106 is coarse, the cap 30 of an underlying connector 20 of an underlying package 10 does not become accidentally attached to the soleplate 106. This is always the case, whether the vacuum nozzle presses on the slick surface 300 of the cap 30 of the relevant connector 20, or

whether the vacuum nozzle presses on the upper plane 108 of the relevant soleplate 106 of the topmost package 10.

[0013] While the present invention has been described with reference to a specific embodiment, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications to the present invention can be made to the preferred embodiment by those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.